



#24

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<110> Yamamoto, H. et al.

<120> Plant Vde Genes and Methods Related
Thereeto

<130> 15619/03/US

<140> US 09/075,375

<141> 1998-07-05

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<151> 1996-11-07

<150> PCT/US96/18291

<151> 1996-11-07

<150> US 60/023,502

<151> 1996-08-06

<150> US 60/006,315

<151> 1995-11-07

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taagcttcaa	gtactccgat	cgtcaggtgg	cctttggaag	ccaacaaact	ggct atg	237
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					1	

gct	ctt	tct	ctt	cac	act	gta	ttt	ctc	tgc	aaa	gag	gaa	gcc	ctc	aat	285
Ala	Leu	Ser	Leu	His	Thr	Val	Phe	Leu	Cys	Lys	Glu	Glu	Ala	Leu	Asn	
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Leu	Tyr	Ala	Arg	Ser	Pro	Cys	Asn	Glu	Arg	Phe	His	Arg	Ser	Gly	Gln	

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Phe Asn Ser Phe Arg Leu Phe Thr Ser Tyr Lys Thr Ser Ser Phe Ser			
50	55	60	65
gat tct agc cat tgc aag gat aaa tct cag ata tgc agc atc gat aca			477
Asp Ser Ser His Cys Lys Asp Lys Ser Gln Ile Cys Ser Ile Asp Thr			
70	75	80	
agt ttt gag gaa ata caa aga ttt gat ctc aaa agg ggc atg act ttg			525
Ser Phe Glu Glu Ile Gln Arg Phe Asp Leu Lys Arg Gly Met Thr Leu			
85	90	95	
att ctt gaa aag caa tgg aga caa ttc ata caa ttg gct atc gta ttg			573
Ile Leu Glu Lys Gln Trp Arg Gln Phe Ile Gln Leu Ala Ile Val Leu			
100	105	110	
gtt tgc aca ttt gtt atc gtt ccc aga gtt gat gcc gtt gat gct ctt			621
Val Cys Thr Phe Val Ile Val Pro Arg Val Asp Ala Val Asp Ala Leu			
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aaa act tgt gct tgt tta ctc aaa gaa tgc agg att gag ctt gca aaa			669
Lys Thr Cys Ala Cys Leu Leu Lys Glu Cys Arg Ile Glu Leu Ala Lys			
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Leu Phe Glu Asn Ser Val Val Asp Gln Phe Asn Glu Cys Ala Val Ser			
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Arg Lys Lys Cys Val Pro Arg Lys Ser Asp Val Gly Glu Phe Pro Val			
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Gly Lys Trp Tyr Ile Thr Ser Gly Leu Asn Pro Thr Phe Asp Ala Phe			
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aac tta aca tgg cgc ata aaa act ttg gat ggt ggt ttc ttt act cga	1053
Asn Leu Thr Trp Arg Ile Lys Thr Leu Asp Gly Gly Phe Phe Thr Arg	
260 265 270	
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Ser Ala Val Gln Thr Phe Val Gln Asp Pro Asp Leu Pro Gly Ala Leu	
275 280 285	
tat aat cat gac aat gag ttt ctt cac tac caa gat gac tgg tac ata	1149
Tyr Asn His Asp Asn Glu Phe Leu His Tyr Gln Asp Asp Trp Tyr Ile	
290 295 300 305	
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310 315 320	
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Tyr Arg Gly Arg Asn Asp Ala Trp Asp Gly Tyr Gly Gly Ser Val Ile	
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Tyr Thr Arg Ser Pro Thr Leu Pro Glu Ser Ile Ile Pro Asn Leu Gln	
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Lys Ala Ala Lys Ser Val Gly Arg Asp Phe Asn Asn Phe Ile Thr Thr	
355 360 365	
gac aat agt tgt ggg cct gag cct cca ttg gtg gaa agg ctt gag aaa	1389
Asp Asn Ser Cys Gly Pro Glu Pro Pro Leu Val Glu Arg Leu Glu Lys	
370 375 380 385	
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Thr Ala Glu Glu Gly Glu Lys Leu Leu Ile Lys Glu Ala Val Glu Ile	
390 395 400	
gaa gaa gag gtt gaa aaa gag gtg gag aag gtt aga gat act gag atg	1485
Glu Glu Glu Val Glu Lys Glu Val Glu Lys Val Arg Asp Thr Glu Met	
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act ttg ttt cag agg ttg ctt gaa ggg ttt aag gag ttg caa caa gat	1533
Thr Leu Phe Gln Arg Leu Leu Glu Gly Phe Lys Glu Leu Gln Gln Asp	
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Glu Glu Asn Phe Val Arg Glu Leu Ser Lys Glu Glu Lys Glu Ile Leu	
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Asn Glu Leu Gln Met Glu Ala Thr Glu Val Glu Lys Leu Phe Gly Arg	
450 455 460 465	

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 Ala Leu Pro Ile Arg Lys Leu Arg
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 acaaaaaaat tgattgtcta ttggtagcca agaggttcac gaaaagactg aaaggggtctt 1863
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 35 40 45
 Tyr Phe Asn Ser Phe Arg Leu Phe Thr Ser Tyr Lys Thr Ser Ser Phe
 50 55 60
 Ser Asp Ser Ser His Cys Lys Asp Lys Ser Gln Ile Cys Ser Ile Asp
 65 70 75 80
 Thr Ser Phe Glu Glu Ile Gln Arg Phe Asp Leu Lys Arg Gly Met Thr
 85 90 95
 Leu Ile Leu Glu Lys Gln Trp Arg Gln Phe Ile Gln Leu Ala Ile Val
 100 105 110
 Leu Val Cys Thr Phe Val Ile Val Pro Arg Val Asp Ala Val Asp Ala
 115 120 125
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 130 135 140
 Lys Cys Ile Ala Asn Pro Ser Cys Ala Ala Asn Val Ala Cys Leu Gln
 145 150 155 160
 Thr Cys Asn Asn Arg Pro Asp Glu Thr Glu Cys Gln Ile Lys Cys Gly
 165 170 175
 Asp Leu Phe Glu Asn Ser Val Val Asp Gln Phe Asn Glu Cys Ala Val
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 Ser Arg Lys Lys Cys Val Pro Arg Lys Ser Asp Val Gly Glu Phe Pro
 195 200 205
 Val Pro Asp Arg Asn Ala Val Val Gln Asn Phe Asn Met Lys Asp Phe
 210 215 220
 Ser Gly Lys Trp Tyr Ile Thr Ser Gly Leu Asn Pro Thr Phe Asp Ala
 225 230 235 240
 Phe Asp Cys Gln Leu His Glu Phe His Met Glu Asn Asp Lys Leu Val
 245 250 255
 Gly Asn Leu Thr Trp Arg Ile Lys Thr Leu Asp Gly Gly Phe Phe Thr
 260 265 270
 Arg Ser Ala Val Gln Thr Phe Val Gln Asp Pro Asp Leu Pro Gly Ala
 275 280 285
 Leu Tyr Asn His Asp Asn Glu Phe Leu His Tyr Gln Asp Asp Trp Tyr
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 Ile Leu Ser Ser Gln Ile Glu Asn Lys Pro Asp Asp Tyr Ile Phe Val

305 310 315 320
 Tyr Tyr Arg Gly Arg Asn Asp Ala Trp Asp Gly Tyr Gly Gly Ser Val
 325 330 335
 Ile Tyr Thr Arg Ser Pro Thr Leu Pro Glu Ser Ile Ile Pro Asn Leu
 340 345 350
 Gln Lys Ala Ala Lys Ser Val Gly Arg Asp Phe Asn Asn Phe Ile Thr
 355 360 365
 Thr Asp Asn Ser Cys Gly Pro Glu Pro Pro Leu Val Glu Arg Leu Glu
 370 375 380
 Lys Thr Ala Glu Glu Gly Glu Lys Leu Leu Ile Lys Glu Ala Val Glu
 385 390 395 400
 Ile Glu Glu Glu Val Glu Lys Glu Val Glu Lys Val Arg Asp Thr Glu
 405 410 415
 Met Thr Leu Phe Gln Arg Leu Leu Glu Gly Phe Lys Glu Leu Gln Gln
 420 425 430
 Asp Glu Glu Asn Phe Val Arg Glu Leu Ser Lys Glu Glu Lys Glu Ile
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 10 15 20

tca aag ctt ccc ggt cat aaa agg ttt agc tgg ggt tgg gaa gat tac 152
 Ser Lys Leu Pro Gly His Lys Arg Phe Ser Trp Gly Trp Glu Asp Tyr
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ttt ggt agt ata gtc gta gca aaa att tgt tcc agc aga cgg ata cct 200
 Phe Gly Ser Ile Val Val Ala Lys Ile Cys Ser Ser Arg Arg Ile Pro
 40 45 50

aga tac ttt cga aaa tct cct aga ata tgc tgt ggt ttg gat tca aga 248
 Arg Tyr Phe Arg Lys Ser Pro Arg Ile Cys Cys Gly Leu Asp Ser Arg
 55 60 65

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agc att aac cag aat gta cct aag gga aat tca gga tgc aaa ttt cca	344
Ser Ile Asn Gln Asn Val Pro Lys Gly Asn Ser Gly Cys Lys Phe Pro	
90 95 100	
aaa gat gta gct ttg atg gtt tgg gag aaa tgg ggc caa ttt gcc aaa	392
Lys Asp Val Ala Leu Met Val Trp Glu Lys Trp Gly Gln Phe Ala Lys	
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Thr Ala Ile Val Ala Ile Phe Ile Leu Ser Val Ala Ser Lys Ala Asp	
120 125 130	
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Ala Val Asp Ala Leu Lys Thr Cys Thr Cys Leu Leu Lys Glu Cys Arg	
135 140 145	
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Leu Glu Leu Ala Lys Cys Ile Ser Asn Pro Ala Cys Ala Ala Asn Val	
150 155 160 165	
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Ala Cys Leu Gln Thr Cys Asn Asn Arg Pro Asp Glu Thr Glu Cys Gln	
170 175 180	
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Ile Lys Cys Gly Asp Leu Phe Glu Asn Ser Val Val Asp Glu Phe Asn	
185 190 195	
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Glu Cys Ala Val Ser Arg Lys Lys Cys Val Pro Arg Lys Ser Asp Val	
200 205 210	
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Gly Asp Phe Pro Val Pro Asp Pro Ser Val Leu Val Gln Lys Phe Asp	
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Asn Lys Leu Val Gly Asn Leu Ser Trp Arg Ile Arg Thr Pro Asp Gly	
265 270 275	
gga ttt ttt act cga tca gcg gtg caa aaa ttc gtg caa gat cca aag	920
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280 285 290	

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gtc acc tta ttc agt aaa ctg ttt gaa ggt ttt aaa gag ctc caa cga Val Thr Leu Phe Ser Lys Leu Phe Glu Gly Phe Lys Glu Leu Gln Arg 425 430 435	1352
gat gaa gag aac ttc tta aga gag ctg agc aaa gaa gaa atg gat gtt Asp Glu Glu Asn Phe Leu Arg Glu Leu Ser Lys Glu Glu Met Asp Val 440 445 450	1400
ttg gat gga ctt aaa atg gaa gca act gag gta gaa aaa ctt ttt ggg Leu Asp Gly Leu Lys Met Glu Ala Thr Glu Val Glu Lys Leu Phe Gly 455 460 465	1448
cgt gct tta cca ata agg aaa tta agg taagtatttt taaaactatc Arg Ala Leu Pro Ile Arg Lys Leu Arg 470 475	1495
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Ser Asp Asp Gly Ile Gly Arg Leu Gly Ile Thr Arg Lys Arg Ile Asn
25 30 35

ggc act ttc ttg ctc aag att tta cct cca atc caa agt gct gat ctc 200
Gly Thr Phe Leu Leu Lys Ile Leu Pro Pro Ile Gln Ser Ala Asp Leu
40 45 50

aga aca act ggt ggg aga tcc tca cgt cct tta tct gca ttc agg tca 248
Arg Thr Thr Gly Gly Arg Ser Ser Arg Pro Leu Ser Ala Phe Arg Ser
55 60 65

gga ttc tct aag ggg ata ttt gac att gtg cca tta cca tca aag aat 296
Gly Phe Ser Lys Gly Ile Phe Asp Ile Val Pro Leu Pro Ser Lys Asn
70 75 80

gag ctg aaa gag ctg acc gct ccg ctg ttg cta aaa ctc gtg ggt gtt 344
Glu Leu Lys Glu Leu Thr Ala Pro Leu Leu Leu Lys Leu Val Gly Val
85 90 95 100

tta gct tgc gcg ttc ctt att gtt cca tct gca gat gca gtt gat gca 392
Leu Ala Cys Ala Phe Leu Ile Val Pro Ser Ala Asp Ala Val Asp Ala
105 110 115

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Lys	Cys	Ile	Ala	Asn	Pro	Ala	Cys	Ala	Ala	Asn	Val	Ala	Cys	Leu	Gln		
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Thr	Cys	Asn	Asn	Arg	Pro	Asp	Glu	Thr	Glu	Cys	Gln	Ile	Lys	Cys	Gly		
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Ser	Arg	Lys	Lys	Cys	Val	Pro	Arg	Lys	Ser	Asp	Leu	Gly	Glu	Phe	Pro		
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gcc	cca	gac	cct	tct	gtt	ctt	gta	cag	aac	ttc	aac	atc	tcg	gac	ttt		680
Ala	Pro	Asp	Pro	Ser	Val	Leu	Val	Gln	Asn	Phe	Asn	Ile	Ser	Asp	Phe		
			200					205					210				
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Asn	Gly	Lys	Trp	Tyr	Ile	Thr	Ser	Gly	Leu	Asn	Pro	Thr	Phe	Asp	Ala		
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Tyr	Ile	Leu	Ser	Ser	Lys	Ile	Glu	Asn	Lys	Pro	Glu	Asp	Tyr	Ile	Phe		
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 345 350

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 Arg Thr Asp Asn Thr Cys Gly Pro Glu Pro Ala Leu Val Glu Arg Ile 370
 360 365

gag aag aca gtg gaa gaa ggt gaa agg ata atc gta aaa gag gtt gaa 1208
 Glu Lys Thr Val Glu Glu Gly Glu Arg Ile Ile Val Lys Glu Val Glu 385
 375 380

gag ata gaa gaa gag gta gag aag gaa gtg gag aag gtc ggt agg act 1256
 Glu Ile Glu Glu Glu Val Glu Lys Glu Val Glu Lys Val Gly Arg Thr 400
 390 395

gag atg acc ttg ttc cag aga ttg gct gaa gga ttt aat gaa ctg aag 1304
 Glu Met Thr Leu Phe Gln Arg Leu Ala Glu Gly Phe Asn Glu Leu Lys 420
 405 410 415

caa gac gag gag aat ttc gtg aga gag tta agt aaa gaa gag atg gag 1352
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 425 430

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 440 445

ggg aaa gct ttg cca atc agg aag gtc agg tagaaacaag aaccaccatt 1450
 Gly Lys Ala Leu Pro Ile Arg Lys Val Arg 460
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 Ala Phe Arg Ser Gly Phe Ser Lys Gly Ile Phe Asp Ile Val Pro Leu 80
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 Pro Ser Lys Asn Glu Leu Lys Glu Leu Thr Ala Pro Leu Leu Leu Lys 95
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Gly	Glu	Phe	Pro	Ala	Pro	Asp	Pro	Ser	Val	Leu	Val	Gln	Asn	Phe	Asn	
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